User's Manual

PH201G (Style B) Distributor

IM 19B01E04-02E

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YOKOGAWA
Yokogawa Electric Corporation

IM 19B01E04-02E
6th Edition

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◆ INTRODUCTION

This instruction manual describes the procedures for installing, wiring and carrying out simple maintenance on the PH201G distributor used in the "2-wire Type Transmitter System".

Please read this instruction manual through completely before working with the PH201G.

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◆ For the safe use of this equipment

■ Safety, Protection, and Modification of the Product

- In order to protect the system controlled by the product and the product itself and ensure safe operation, observe the safety precautions described in this user's manual. We assume no liability for safety if users fail to observe these instructions when operating the product.
- If this instrument is used in a manner not specified in this user's manual, the protection provided by this instrument may be impaired.
- Be sure to use the spare parts approved by Yokogawa Electric Corporation (hereafter simply referred to as YOKOGAWA) when replacing parts or consumables.
- Modification of the product is strictly prohibited.
- The following symbols are used in the product and user's manual to indicate that there are precautions for safety:

■ Notes on Handling User's Manuals

- Please hand over the user's manuals to your end users so that they can keep the user's manuals on hand for convenient reference.
- Please read the information thoroughly before using the product.
- The purpose of these user's manuals is not to warrant that the product is well suited to any particular purpose but rather to describe the functional details of the product.
- No part of the user's manuals may be transferred or reproduced without prior written consent from YOKOGAWA.
- YOKOGAWA reserves the right to make improvements in the user's manuals and product at any time, without notice or obligation.
- If you have any questions, or you find mistakes or omissions in the user's manuals, please contact our sales representative or your local distributor.

■ Warning and Disclaimer

The product is provided on an "as is" basis. YOKOGAWA shall have neither liability nor responsibility to any person or entity with respect to any direct or indirect loss or damage arising from using the product or any defect of the product that YOKOGAWA can not predict in advance.

Symbol Marks

Throughout this user's manual, you will find several different types of symbols are used to identify different sections of text. This section describes these icons.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

NOTE

Draws attention to information essential for understanding the operation and features.

◆ After-sales Warranty

- **Do not modify the product.**

- **During the warranty period, for repair under warranty consult the local sales representative or service office. Yokogawa will replace or repair any damaged parts. Before consulting for repair under warranty, provide us with the model name and serial number and a description of the problem. Any diagrams or data explaining the problem would also be appreciated.**

  - If we replace the product with a new one, we won't provide you with a repair report.
  - Yokogawa warrants the product for the period stated in the pre-purchase quotation Yokogawa shall conduct defined warranty service based on its standard. When the customer site is located outside of the service area, a fee for dispatching the maintenance engineer will be charged to the customer.

- **In the following cases, customer will be charged repair fee regardless of warranty period.**

  - Failure of components which are out of scope of warranty stated in instruction manual.
  - Failure caused by usage of software, hardware or auxiliary equipment, which Yokogawa Electric did not supply.
  - Failure due to improper or insufficient maintenance by user.
  - Failure due to modification, misuse or outside-of-specifications operation which Yokogawa does not authorize.
  - Failure due to power supply (voltage, frequency) being outside specifications or abnormal.
  - Failure caused by any usage out of scope of recommended usage.
  - Any damage from fire, earthquake, storms and floods, lightning, disturbances, riots, warfare, radiation and other natural changes.

- **Yokogawa does not warrant conformance with the specific application at the user site. Yokogawa will not bear direct/indirect responsibility for damage due to a specific application.**

- **Yokogawa Electric will not bear responsibility when the user configures the product into systems or resells the product.**

- **Maintenance service and supplying repair parts will be covered for five years after the production ends. For repair for this product, please contact the nearest sales office described in this instruction manual.**

PH201G (Style B)
Distributor

IM 19B01E04-02E 6th Edition

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1. Overview

This distributor, designed exclusively for use with these 2-wire transmitter, supplies drive power to the 2-wire transmitter while simultaneously receiving 4 to 20 mA DC current signal from the transmitter and converting it to 1 to 5 V DC voltage signal; it also simultaneously receives a digital signal superimposed on 4 to 20 mA DC signal, and provides contact outputs during hold, failure, and / or cleaning.

A current limiter function is built into this unit so it can continue to operate properly even with a short circuit on the transmitter side.

1.1 Standard Specifications

<Input / Output Signal Specifications>

Number of input points (Number of transmitter units connectable): 1 point
Output signal: 1 to 5 V DC (2 points)
Load resistance: 2 kΩ or more (1 to 5 V DC Output)
Isolation system: Loop isolation type

<Mounting / Form>

Mounting method: Indoor rack mounting
Connection method: External signal connection: M4 screw terminal connection
Power supply / Ground connection:
100 V: JIS C8303 ground type 2 plug connection
220 V: CEE 7VII (European electrical device standard) plug connection
Cable length: 300 mm
External dimensions: 180H x 48W x 300D mm
Weight: Approx. 1.7 kg (Including rack and case)

<Standard Specifications>

Accuracy: ±0.2 % of span
Transmitter supply voltage: 26.5 ± 1.5 V DC
Insulation resistance
Between I/O terminals and ground pin: 100 MΩ / 500 V DC
Between power supply pins and ground pin: 100 MΩ / 500 V DC

<Operating Specifications>

Ambient temperature: 0 to 50 °C
Ambient humidity: 5 to 90 % RH (Non-condensing)
Power supply: Dual use AC/DC
100 V: DC power 20 to 130 V, no polarity
AC power 80 to 138 V, 47 to 63 Hz
220 V: DC power 120 to 340 V, no polarity
AC power 138 to 264 V, 47 to 63 Hz
Maximum current and power consumption
24 V DC: Approx. 200 mA
100 V AC: Approx. 7 VA
220 V AC: Approx. 11 VA

<Contact Output>

Contact rating: 250 V AC, maximum 100 VA
220 V DC, maximum 50 VA

Hold contact output: N.C. 1 contact, Normally energized
Contact closes when power is off or during maintenance.

Failure contact output: N.C. 1 contact, Normally energized
Contact closes when power is off or during failure.

Cleaning contact output: 1 contact, Close during cleaning only
Used as drive contact for solenoid valve for cleaning.

<Regulatory Compliance>

Korea Electromagnetic Conformity Standard Class A 한국 전자파적합성 기준

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1.2 Model and Suffix Codes

Model	Suffix Code	Option Code	Specification
PH201G	••••••••••••••••••••	••••••••••••••••••	Distributor
Power Supply	**-A1** **-A2**	•••••••••••••••••• ••••••••••••••••••	100 V AC 220 V AC
—	***B**	••••••••••••••••••	Style B
Option		**/TB**	Terminal for Power connection

1.3 External Dimensions

Unit : mm

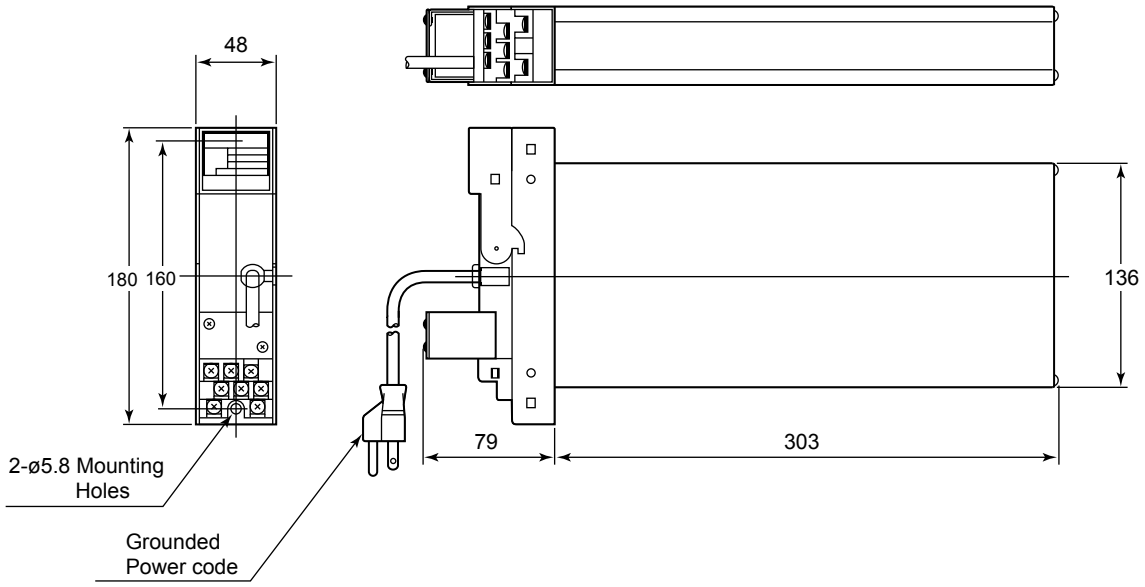

Figure 1.1 PH201G-Au*B Distributor External Dimensions

Unit : mm

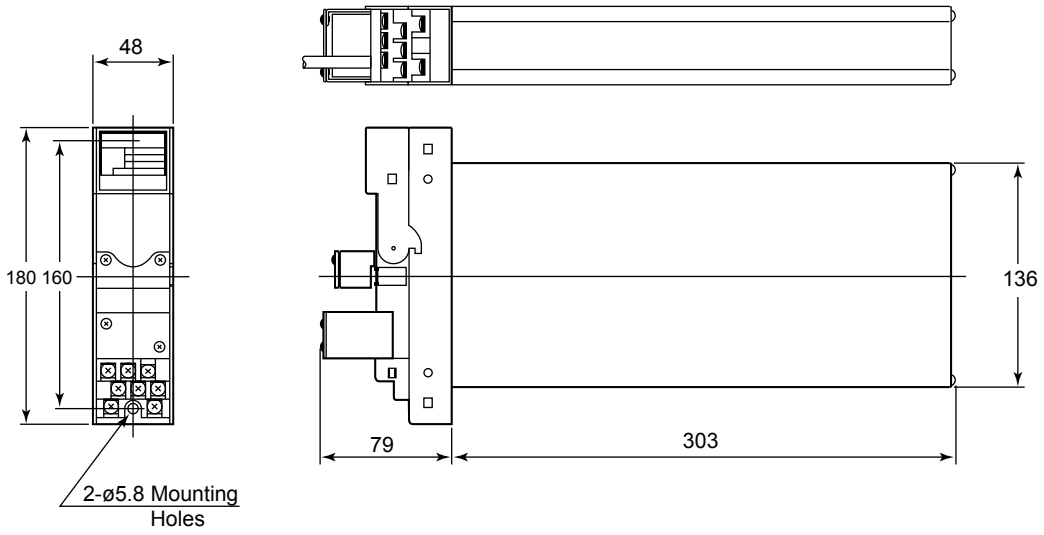

Figure 1.2 PH201G-Au*B/TB Distributor External Dimensions

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2. Installation

2.1 Unpacking, and Verifying Specifications

This instrument was thoroughly inspected at the factory before shipment. When you have received it, please check visually to verify that no damage has occurred. Also check that the spare fuse, a standard accessory, is present.

The model and suffix codes are inscribed on the nameplate attached to the front of the instrument. Check the product model and suffix codes on the instrument's nameplate against those listed in Section 1.2 to verify that the product is exactly what was ordered.

Should any questions arise, please contact your sales representative or YOKOGAWA sales office.

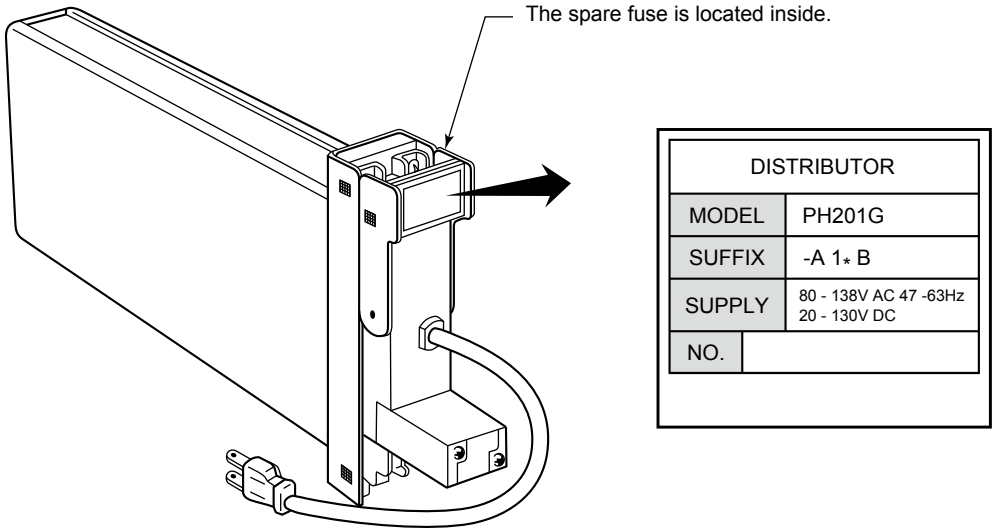
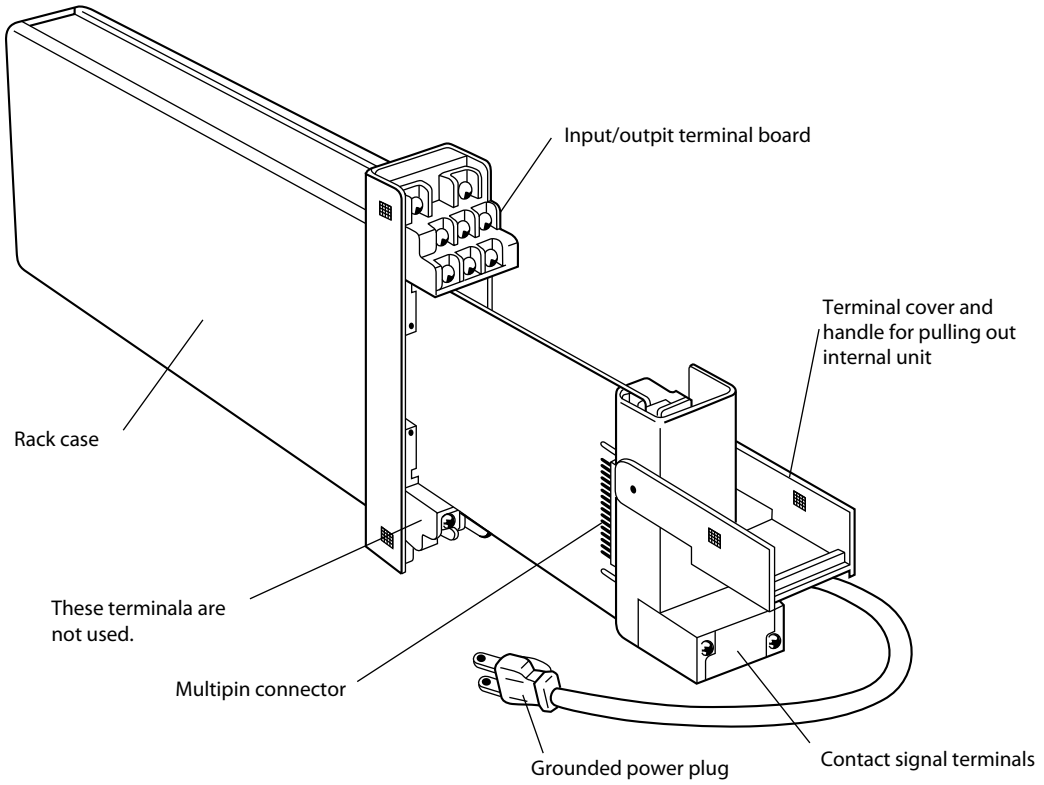


Figure 2.1 Location of Nameplate

2.2 PH201G Distributor Construction

The PH201G distributor is a rack instrument. It has a 2-piece construction that enables the internal unit to be separated from the rack case. The internal unit is connected to the rack case by a multi pin connector so that it can be inserted and removed without disconnecting the external wiring to the instrument's terminals. However, in the case of a terminal-connected power-supply wired distributor, or if wiring is connected to the contact signal terminals on the internal unit, that wiring must be removed. The rack-case terminal-board cover can be used as a handle for pulling out the internal unit.



Note: The figure shows the Model PH201G-A□*B distributor. The PH201G-A□*B/TB lacks a power cord with a ground plug, having instead a power connection terminal board on the internal unit.

Figure 2.2 PH201G Distributor Construction

2.3 Rack Construction

The PH201G distributor can be mounted on the same rack as other YOKOGAWA rack instruments. Figure 2.3 is a configuration for mounting several rack instruments as a group. The angle iron used for mounting must be strong enough to support all of the instruments. The example in Figure 2.3 illustrates general practice, using an angle iron 40340 mm wide and 5 mm thick.

For safety, and to prevent problems with the cables used for electrical wiring, use a plastic wiring duct, and run the wiring that connects to the instruments through this dust.

Unless terminal board connection is specifically desired, the rack instrument power supply and ground connections are provided via a power cord and plug (a two-prong plug with a ground connection, JIS C8303, for 15 A, 125 V service). Connect this plug to a compatible receptacle (See Figure 2.4)

Unit: mm

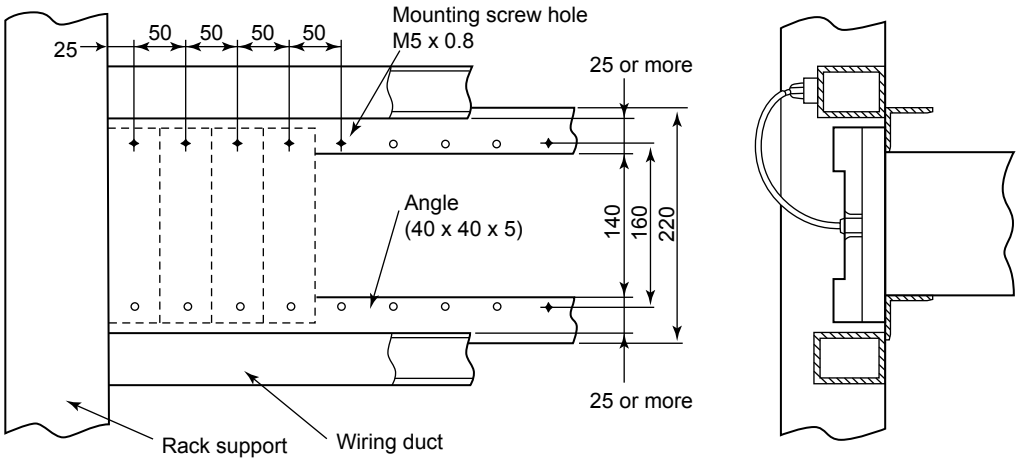


Figure 2.3 Rack Configuration (Example)

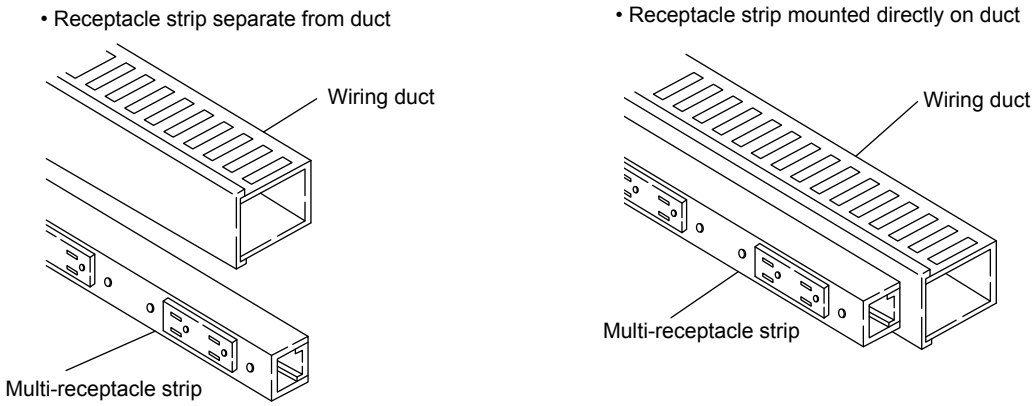


Figure 2.4 Examples of Mounting a Receptacle Strip

2.4 Mounting

The PH201G distributor can be mounted with the internal unit in the rack case, but mounting is easier if the internal unit is removed.

(1) Insert the case into the rack. Orient the case so that the multipin connector is on the left. Align the two mounting holes on the case with the screw holes on the rack, and fasten the case in place with two mounting screws (M5x0.8) [see Figure 2.5].

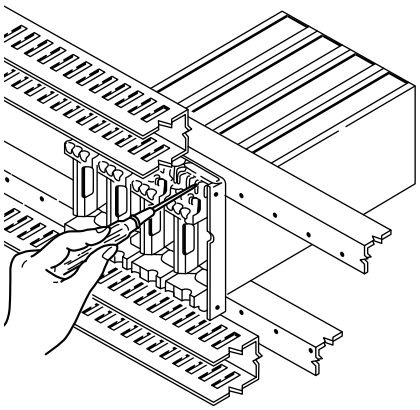


Figure 2.5 Rack-Case Mounting

(2) Pass the electrical wires through the wiring duct and pull them out. Run the wires connecting to the input / output terminal board through the upper duct; through the lower duct run the wires connecting to the contact signal output terminals, and also the power wiring in the case of a terminal-connected power wired model (see Figure. 2.6)

Do not connect the wiring to the contact signal output terminals, or to the power supply / ground terminals of a terminal-connected power model, at this time; wait until after the internal unit is plugged into the case in (4) below.

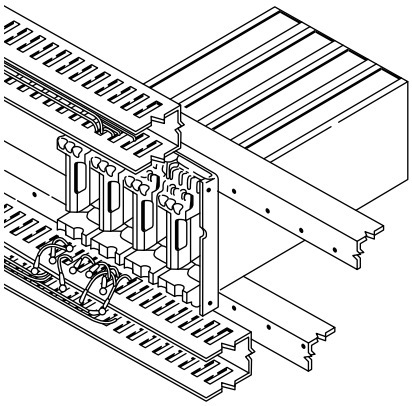


Figure 2.6 Wiring

(3) Connect the wiring that has been pulled through the ducts to the appropriate terminals. See Section 2.6, “External Wiring”, concerning connections to individual terminals.

(4) Plug the internal unit into the case, being careful to make sure that you are inserting it in the proper location. There are labels on the internal unit and the case. If tag numbers have been assigned to the labels, compare them and make sure that they match before inserting the internal unit (see Figure 2.7). If using contact signal out puts, or terminal-connected power wiring, connect the relevant wires to the appropriate terminals.

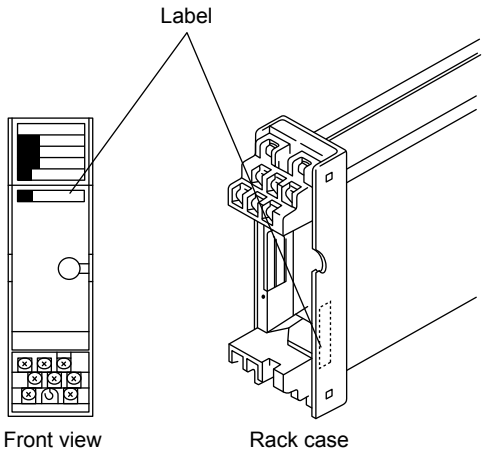


Figure 2.7 Location of Labels

(5) Replace the cover on the terminal section. If the instrument has a power cord, insert the power plug into the receptacle above the instrument (see Figure 2.8).

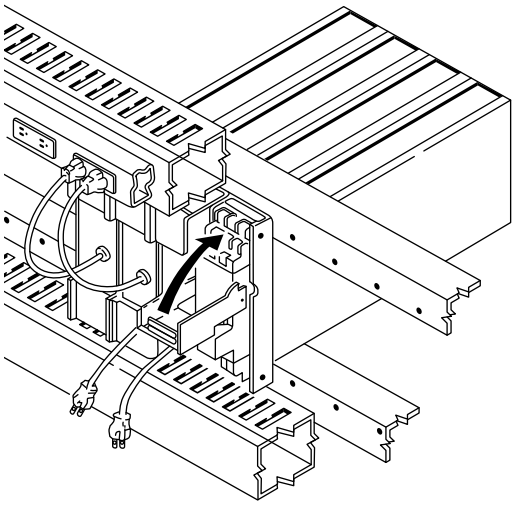


Figure 2.8 Placement of Internal Unit

2.5 Removing the Internal Unit

It is sometimes necessary to remove the internal unit from the case to make adjustments and carry out maintenance on the instrument. This section describes the procedure for removing the internal unit in such cases.

To remove the internal unit, it is not necessary to remove the terminal board wiring. Because the internal unit and the terminal board (case) are connected by a multipin connector, separating them at this connector enables the internal unit to be removed from the case while leaving the wiring to the terminal board in place. However, if there is wiring to the contact signal terminals on the front of the internal unit, or if it is a terminal-connected power wired model, that wiring must be removed.

(1) Unplug the power cord from the receptacle.

(2) Pull the terminal cover down toward you. The cover also serves as a handle for removing the internal unit. Hook your fingers around the terminal cover and pull out the internal unit.

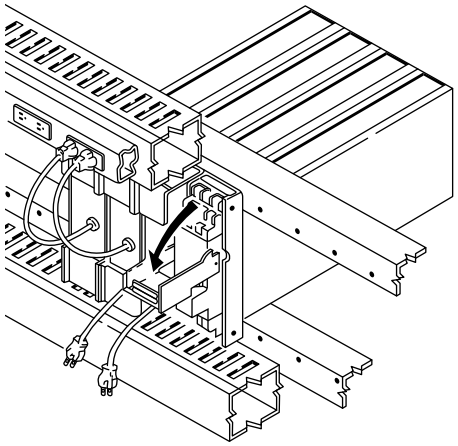


Figure 2.9 Internal Unit Removal (1)

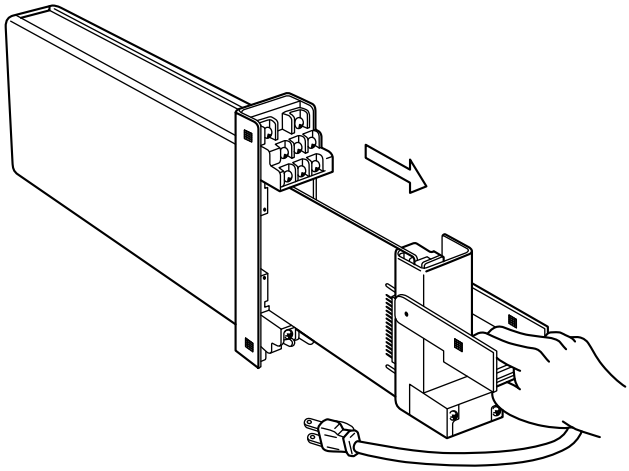


Figure 2.10 Internal Unit Removal (2)

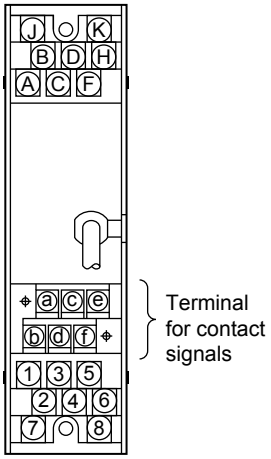
2.6 External Wiring

(1) Mount round M4-screw crimp terminal lugs on the wires to be connected to the terminals.

(2) If the internal unit is already installed in the rack case, pull the terminal cover down away from the terminals and connect the wires. Wiring to the terminals on the internal unit such as wiring to the contact signal terminals should also be done with their terminal covers removed.

(3) Refer to Figure 2.11 or 2.12 to identify the individual terminals to which to connect the wiring.

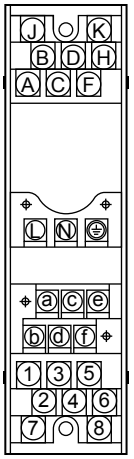
(4) After completing wiring, be sure to reinstall the contact signal terminal cover and the internal unit serves also as a lock to prevent the internal unit from being removed from the case accidentally. Check that the internal unit is firmly inserted.



Terminal symbol	Signal name
A	+
B	-
C	OUT1(1 to 5V DC)
D	CMN(Common)
F	OUT2 (1 to 5V DC)
H	CMN(Common)
J	CMN (For safety barrier)
K	(Not used)
1	(Not used)
2	
3	
4	
5	
6	
7	
8	
	Contact signals
a,b	HOLD (hold)
c,d	FAIL (failure)
e,f	WASH (cleaning)

(Note) Terminal symbol mark of "a" to "f" for contact signals are not printed.

Figure 2.11 Terminal Assignment Diagram and Wiring (For Units with a Power Cord)



Terminal symbol	Signal name
A	+
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C	OUT1(1 to 5V DC)
D	CMN(Common)
F	OUT2 (1 to 5V DC)
H	CMN(Common)
J	CMN (For safety barrier)
K	(Not used)
1	(Not used)
2	
3	
4	
5	
6	
7	
8	
	Contact signals
a,b	HOLD (hold)
c,d	FAIL (failure)
e,f	WASH (cleaning)
L,N	Power supply (AC or DC, either polarity)
⏚	Grounding

(Note) Terminal symbol mark of "a" to "f" for contact signals are not printed.

Figure 2.12 Terminal Assignment Diagram and Wiring (For Units with Terminal-Connected Power Supply Wiring)

3. Operating Principles

3.1 Loop Isolation

For a two-wire transmitter, approximately 26.5 V is supplied through a current regulator CL, and a 4 to 20 mA current signal is obtained. The current regulator orevents excessive current when there is a short circuit in the field wiring. The current signal is converted to 1 to 5 V, which passes through an output amplifier to become the output signal.

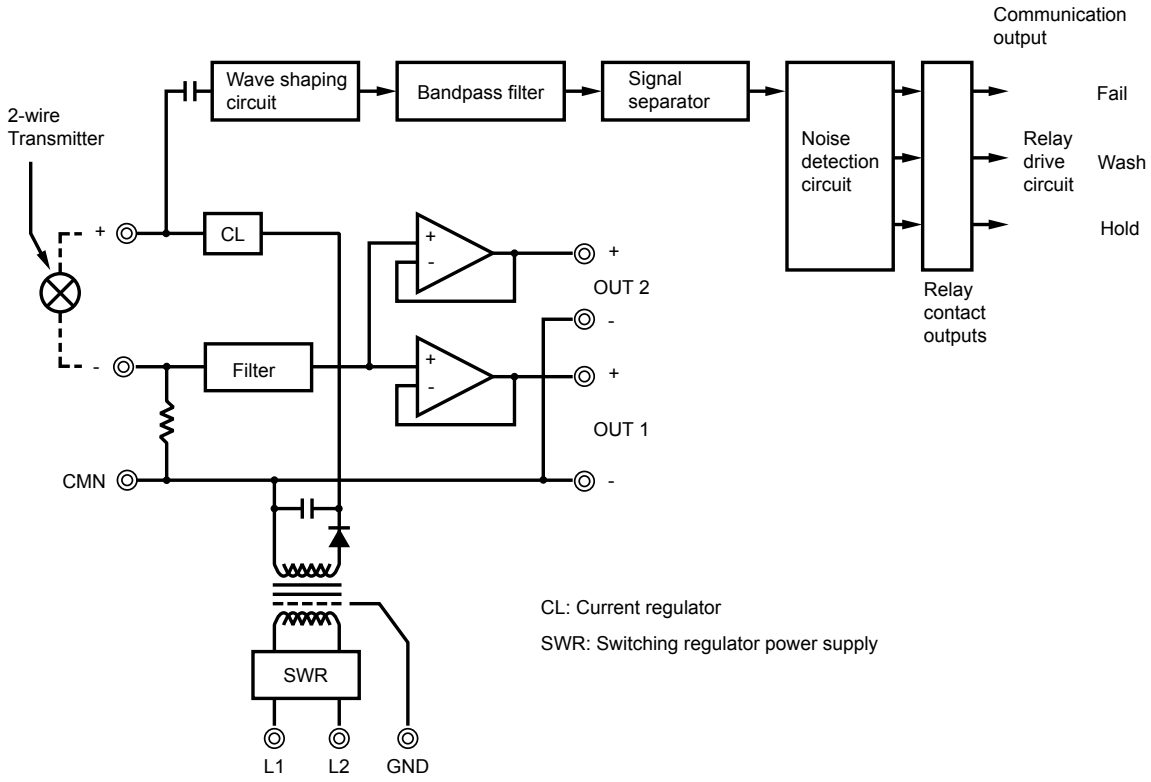

Figure 3.1 PH201G Distributor Block Diagram

3.2 Communications Function

If the communications setting of a 2-wire transmitter is set to “communications ON”, as AC signal of approximately 500 Hz (approximately 2 mA p-p) is superimposed on the 4 to 20 mA line. Within this signal, “fail”, “wash”, and “hold” signals are incorporated as serial signals. The PH201G distributor distinguished ON and OFF individually for each of these three types of signals, and outputs them as relay contact signals. The signal update interval is approximately 1.2 seconds.

Notice: Jumper J1 in the upper middle of the printed circuit board is the Jumper associated with the communication operation. Normally position of the jumper J1 is set to the <a>. When the communication operation is not stable, you can set to <b>.

4. Operation

After mounting and wiring have been completed, you need only turn on the power to set this instrument in operation. Before beginning operation, you should first perform the inspections and check in Section 4.2. Note that no operator actions or manipulations are required when this instrument is operating.

4.1 Components

Note: The figure shows the Model PH201G-A□*B distributor. The PH201G-A□*B/TB lacks a power cord with a ground plug, having instead a power connection terminal board on the internal unit.

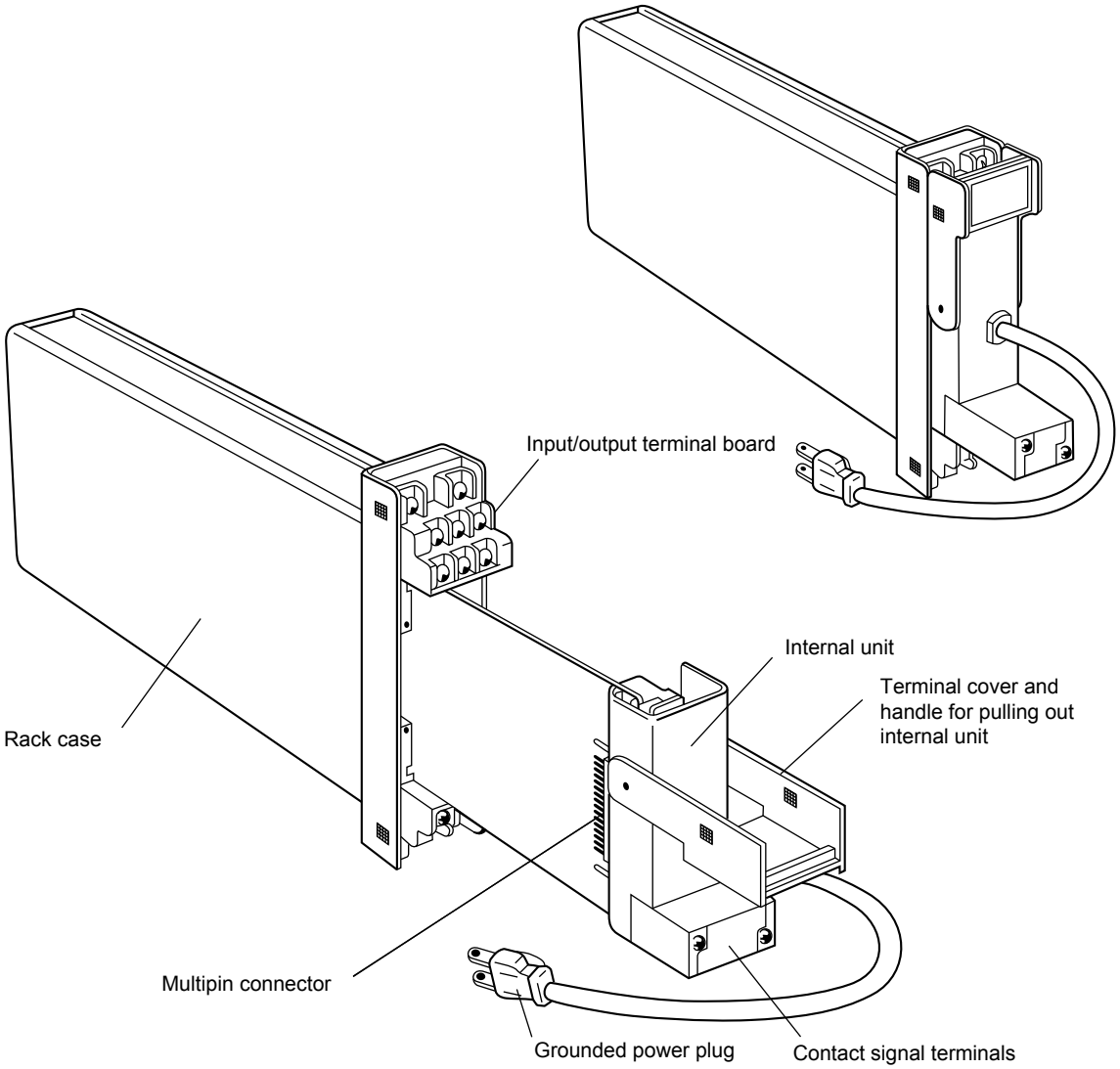

Figure 4.1 Components

4.2 Pre-Operation Checks

Before beginning operation, inspect / check the following Items.

(1) Pull out the internal unit and check that the fuse installation in the fuse holder at the rear of the internal unit is of the proper rating for the power source. When returning the internal unit to the rack case, make sure that the connector that connects the internal unit and the case is properly mated.

(2) Check that external wiring to the terminal boards has been performed correctly.

(3) If the unit has a power cord, check that the grounded power plug is correctly inserted into the receptacle.

4.3 Communication Output

The individual relay contact outputs for “fail”, “wash”, and “hold” will be in the states shown below depending on whether the power is ON or OFF for a PH201G distributor, and whether communications are ON or OFF for a 2-wire transmitter.

Table 4.1

Communication and power status	**Transmitter communications**	—		**OFF**	**ON**
	PH201G power	**OFF**	**Immediately after ON**	**ON**	
Contact	Fail	Closed	Open	Open	Communications output
	Wash	Open	Open	Open	Communications output
	Hold	Closed	Open	Open	Communications output

5. Maintenance

5.1 Fuse Replacement

When a fuse open-circuits, investigate and deal with the cause, and then replace the fuse as below. If the cause of the loss of continuity is the fuse itself, it is possible that the fuse holder is dirty or the contact is bad, and this should be checked.

(1) Detach the open fuse by pulling it strongly in the direction indicated by the arrow in Figure 5.1, and remove it.

(2) Install a new fuse, after checking its rating.

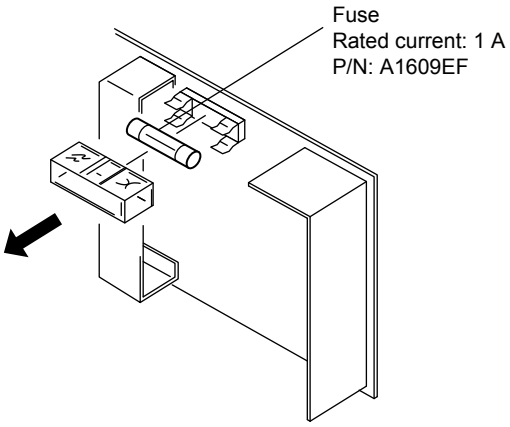

Figure 5.1 Fuse Replacement

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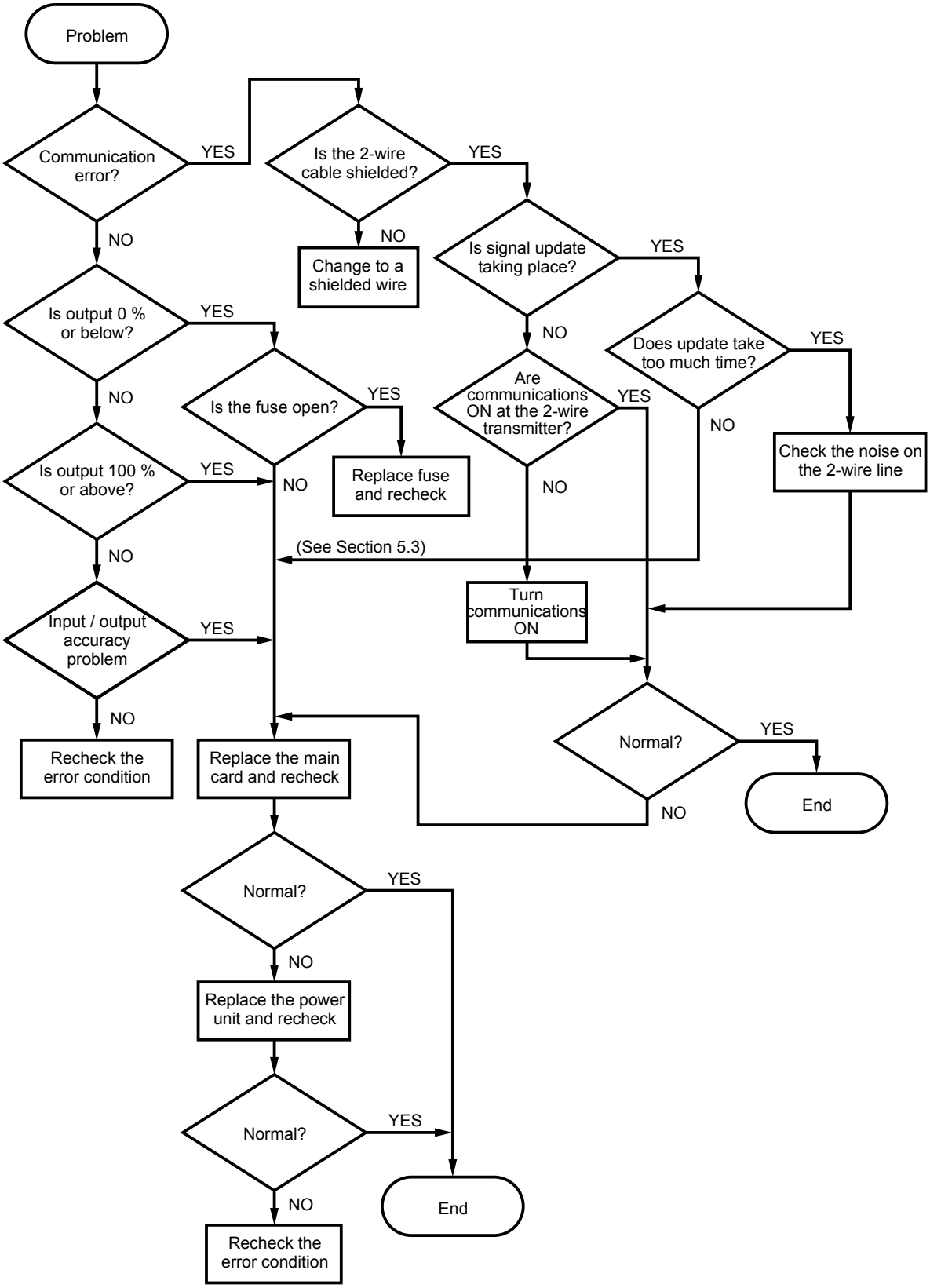
6. Trouble shooting

If a problem occurs during operation, take corrective action according to the troubleshooting flowchart in Section 6.1. Consult your YOKOGAWA service representative if serious trouble is suspected.

6.1 Troubleshooting Flowchart



6.2 Part Replacement Procedure

The following shows the disassembly procedures to be used when replacing parts.

Disassembly should be limited to a minimum; disassemble carefully, and no more than necessary. To reassemble after replacing a part, perform the disassembly procedures in reverse order.

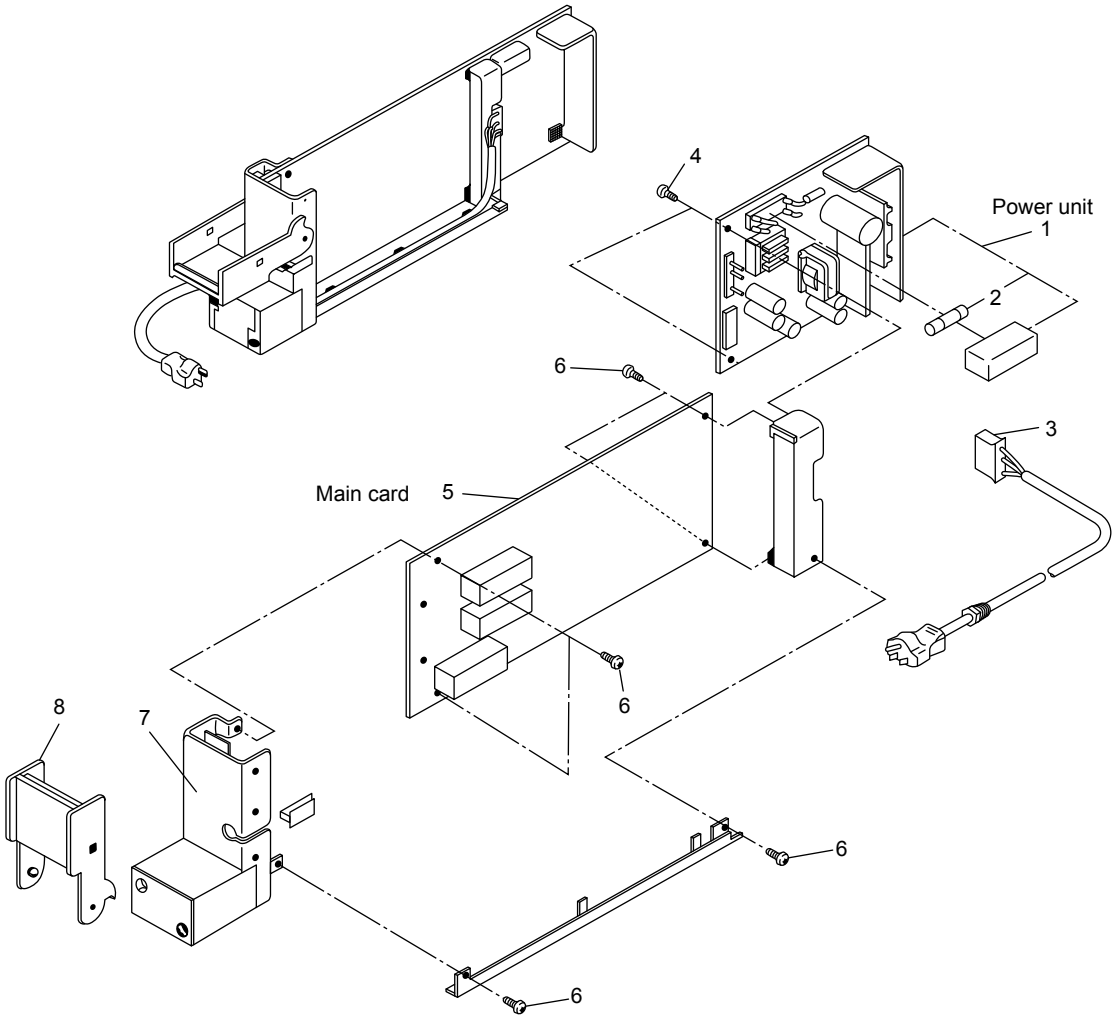


Figure 6.1 PH201G Distributor Construction Drawing

6.2.1 Power Unit Removal

(1) Remove connector 3 from 1.

(2) Remove screw 4 (in two places).

(3) Power unit 1 can be removed by pulling it out from main card 5. The card 5 and power unit 1 are connected by a connector.

6.2.2 Main Card Removal

(1) Remove screw 6 (in six places).

(2) Remove 5 from 1 and 7.

6.2.3 Cover Removal

(1) Cover 8 can be removed easily by spreading the rotating section.

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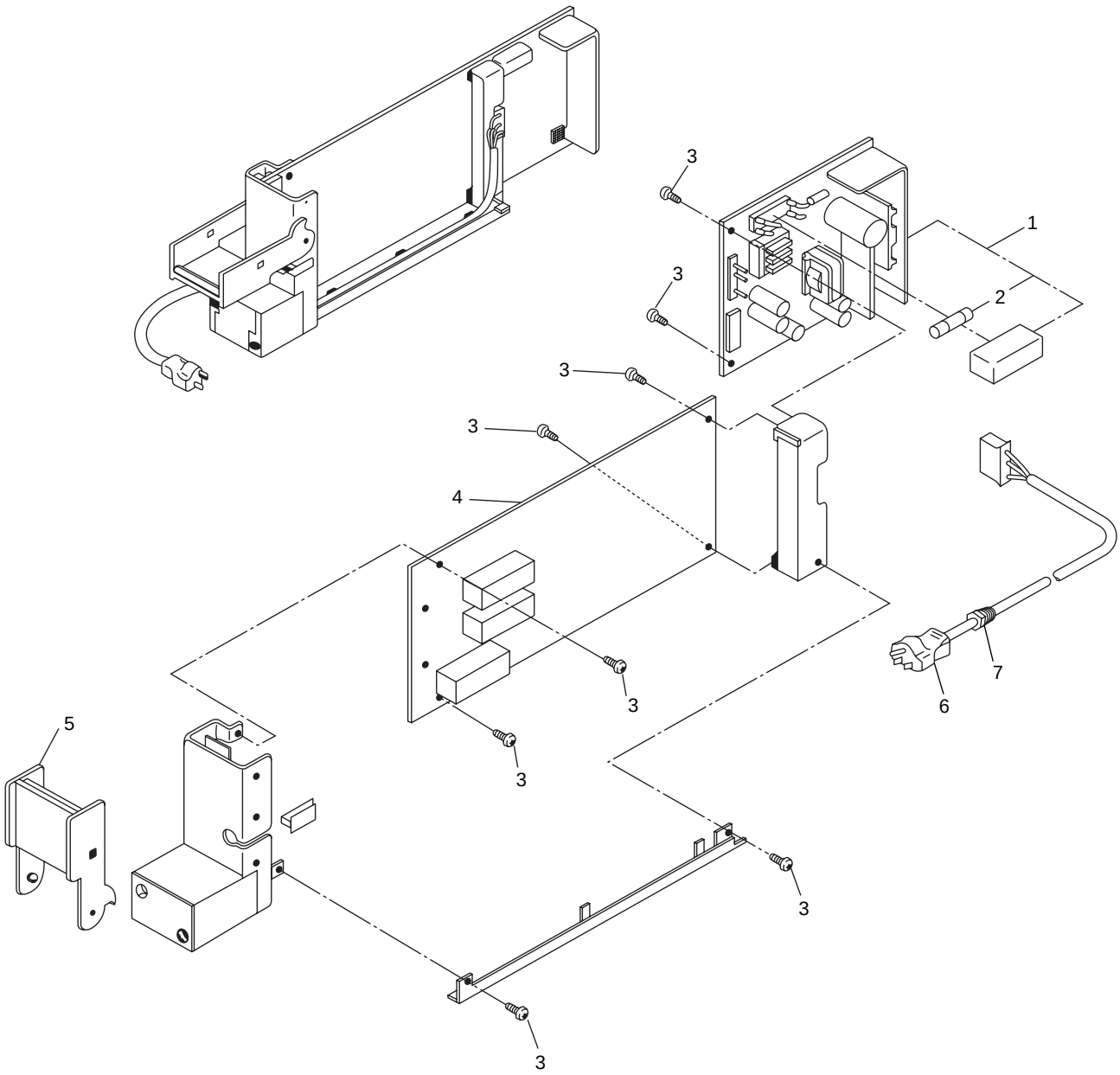
Customer Maintenance Parts List

Model PH201G (*B)
DISTRIBUTOR



Item	Parts No.	Qty	Description
1	E9715YB	1	Power Supply Unit (for 100V Version)
	E9715YS	1	Power Supply Unit (for 220V Version)
2	A1609EF	1	Fuse 1A
3	Y9306JB	8	Pan H. Screw, M3 x 6
4	K9312EF	1	Main Board Assembly
5	E9713CK	1	Cover
6	E9713EG	1	Cable Assembly (for 100V Version)
	E9713FS	1	Cable Assembly (for 220V Version)
7	S9079PB	1	Bushing

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Some of illustrations has been replaced more clearly drawings (no contents changed).

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Some error correction.

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Home page: http://www.yokogawa.com/an

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